

AD-A286 334



SELECTED ACQUISITION REPORTS

September 30, 1994

Army:

A-1	AFATDS
A-2	FMTV
A-3	JAVELIN

Navy:

N-1	F/A-18 C/D
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Air Force:

AF-1	AWACS RSIP
AF-2	CMU
AF-3	NAS

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Further information on these reports may be obtained from:
Directorate for Acquisition Program Integration,
OUSD(A&T) (703) 695-5166

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2850
94-35548



A-1 AFATDS

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NOV 7 1994 12

SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)

PROGRAM: AFATDS

JOINT RESEARCH AND DEVELOPMENT
AND TECHNOLOGY CENTER (JRDTC)
DEPARTMENT OF DEFENSE

AS OF DATE: September 30, 1994

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1. Designation and Nomenclature (Preferred Name):
Advanced Field Artillery Tactical Data System (AFATDS)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

SFAE-CC-FS
Ft Monmouth, NJ 07703-5404
AV 995-3090 COMM 908-544-3090

COL Steven W. Boutelle
Assigned: August 13, 1992

Accession For	
NTIS	CRASH
DTIC	LAB
Unannounced	
Justification	
By	
Distribution	
Availability Codes	
Dist	Avail and/or Special
A-1	

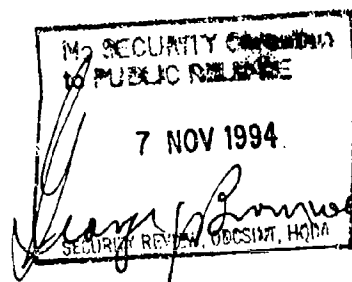
4. Program Elements/Procurement Line Items:

RDT&E:

PE 23726 Project D2ET, D322

PROCUREMENT:

APPN 0350 ICN MIPR (NGRE)
APPN 2035 ICN B28600 (Army)
APPN 2035 ICN B78100 (Army)
APPN 2035 ICN B78400 (Army)
APPN 2035 ICN BA9708 (Army)
APPN 2035 ICN BA9726 (Army) (Shared)
APPN 2035 ICN MA9708 (Army)



5. Related Programs:

ATCCS Common Hardware/Software (CHS), Standard Integrated Command Post System (SICPS)

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OATSD (PA) DFOISR 94-C-1134

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6. Mission and Description:

The Advanced Field Artillery Tactical Data System (AFATDS) is a single, integrated battlefield management and decision support system. It will function at Battery through Corps level as one of the five battlefield automation systems of the Army Tactical Command and Control System (ATCCS). AFATDS utilizes evolving commercial computer technology of the ATCCS Common Hardware/Software (CHS) procurement.

Based on the organizational structure to be supported, AFATDS hardware items will be comprised of the following: Fire Support Control Terminals, Fire Support Terminals, Power Converter Groups, Tactical Communications Interface Module, Mass Storage Expansion Unit, Electronic Printers, Tactical Display Devices, Local Area Network, and installation kits tailored to the Force Structure and available vehicles. This will all be ATCCS Common Hardware.

AFATDS is designed to overcome the size, vulnerability, high sustainment cost, limited functionality, central processing and training limitations of Tactical Fire Direction System (TACFIRE). AFATDS is the Fire Support node of the ATCCS providing advanced software automation assistance to the Fire Support elements. AFATDS will provide 27 Fire Support functions, grouped in five Fire Support operational needs (Fire Support Execution, Fire Support Planning, Movement Control, Field Artillery Mission Support and Field Artillery Fire Direction Operations).

Responsiveness, survivability, and continuity of Fire Support Operations will be enhanced via dispersed processing centers, intelligent remote (work stations) terminals, a distributed data base management system and distributed operations for Fire Support Officers at the Infantry and Armor battalion/brigade levels. AFATDS will interface/interoperate via standard communications media with all functional control elements of existing and future Army Fire Support Systems, other ATCCS Battlefield Functional Area (BFA) Systems, other services employing Fire Support Joint Interoperability Tactical Command and Control Systems message standards and Allied Forces using NATO Fire Support Standards.

Fire Support Ada Conversion (FSAC) and Initial Fire Support Automated System (IFSAS) are associated programs that are included in the AFATDS program baseline.

FSAC will provide an accelerated fielding of ATCCS Common Hardware (CH) until the AFATDS software becomes available. FSAC will convert the existing Battery Computer System (BCS) technical fire control software to Ada and replace the existing BCS hardware with the Lightweight Computer Unit (LCU). These LCUs will ultimately be utilized as the host for the AFATDS software for those applications

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6. Mission and Description (Cont'd):

requiring the LCU under the AFATDS program.

IFSAS will replace the Variable Format Message Entry Device (VFMED) and Battalion TACFIRE and provide the National Guard with an initial automated capability. IFSAS will replace the TACFIRE equipment with the LCU based AN/GYK-37(V)1 hardware with Lightweight TACFIRE (LTACFIRE) software ported to the LCU. Like FSAC, IFSAS reflects an accelerated fielding of the ATCCS CHS until AFATDS software becomes available. As such, it is part of the AFATDS baseline.

7. Program Highlights:

a. Significant Historical Developments --

In 1981, the Department of Defense (DoD) approved the Mission Element Need Statement (MENS) for AFATDS. Approval to proceed into Concept Evaluation without an ASARC I was granted by the Vice Chief of Staff of the Army in March 1984. The contract for Concept Evaluation was awarded May 1984 to Magnavox, Ft Wayne, Indiana. This contract was completed with Concept Evaluation in April 1989. ASARC II/DAB approval to enter Full Scale Development (FSD) was obtained in 4Q89. A sole source FSD contract was awarded to Magnavox in April 1990. The program proceeded with the development of the Version 1 software (Version 3 will meet the objective system requirements) in accordance with MIL-STD 2167A. During 1991, the contractor identified design requirements and initiated detailed design. In 1992, the Version 1 software design was significantly completed. The AFATDS Version 2.0 development effort was initiated in Oct 92.

A revised Acquisition Program Baseline for the AFATDS program was signed on 4 Oct 92.

During 1993, the initial AFATDS Version 1 was completed. Formal Qualification Test (FQT) was completed in Sep 93, and the System Integration Test (SIT) and regression portion of the FQT were performed in Nov 93.

The Operational Test Readiness Review 1 (OTRR) for the AFATDS Force Development Test and Experimentation (FDTE) was conducted on 18 Aug 93 by the Program Executive Officer, Command and Control Systems and the Commander, TEXCOM. The decision from the OTRR was to delay starting FDTE until Jan 94 in order to optimize the results from the FDTE. Approval to proceed with the test was given at follow up OTRRs held in Dec 93 and Jan 94, and the AFATDS FDTE Pilot Test began in Jan 94.

Version 2 startup was slow, as contractor resources were dedicated to completion of Version 1. The Draft System Segment

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7a. Program Highlights (Cont'd):

Specification (SSS) was completed in Oct 93. The System Requirements Review was held at Ft Sill in Nov 93 and the SSS approved in Dec 93.

Preparation for the AFATDS ASARC/Milestone III Decision began with meetings of the COEA Study Advisory Group and the ASARC Ad Hoc Working Group.

The Fire Support Ada Conversion (FSAC) program was officially approved by the NAE in Mar 91. FSAC completed the Preliminary Design Review (PDR) in Mar 91, the Critical Design Review (CDR) in June, and the Formal Qualification Test (FQT) in Sep 91. An Initial Operational Test and Evaluation (IOTE) on the AN/GYK-37 Fire Control System was conducted in Mar 92. FSAC received type classification of the LCU based AN/GYK-37 and production approval was given in Aug 92. In Nov 92, a conditional Materiel Release was granted for the AN/GYK-37 to be fielded as part of the Battery Computer System (BCS). The first fielding of the AN/GYK-37 was in 1Q93 to the National Guard in South Dakota.

The Fire Direction System (FDS) Ada V10 IOTE was successfully held in Mar 93. The FDS V10 FUE was completed immediately afterwards. The Battery Computer System Ada V10 IOTE was completed in Dec 93.

In Jun 91, a Memorandum of Agreement between the National Guard, PEO CCS and PM FATDS was signed for the procurement of the National Guard BCS Ada rehosted software on LCUs for the National Guard units using Dedicated Procurement Program funds. The National Guard procurement is managed concurrent with the active BCS Ada rehost program.

IFSAS was initiated in Aug 91 as an Operation and Support Cost Reduction (OSCR). It was approved as a production level program and funded in FY92. A Memorandum of Agreement (MOA) between the National Guard, PM FATDS and PEO CCS was signed Aug 92 for procurement of IFSAS to be fielded to the National Guard using Dedicated Procurement Program funds. The National Guard IFSAS is managed concurrently to the active IFSAS.

IFSAS proceeded with the port of the LTACFIRE software to the LCU in FY93 and the Package 10 IOTE was successfully completed in May 93. Approval to procure the system was given at the Milestone III IPR held in Jul 93. The IFSAS FUE was to the National Guard in Aug 93.

b. Significant Developments Since Last Report --
This September Exception SAR is being submitted due to schedule slips of 6 months or more.

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7b. Program Highlights (Cont'd):

The AFATDS Force Development Test and Experimentation (FDTE) was conducted from 7 - 26 Feb 94, and was successful in meeting its intended purposes. The FDTE enabled the Project Manager (PM) to completely check out the AFATDS software with the Common Hardware/Software within the context of the Standard Integrated Command Post System (SICPS) using tactical communications and doctrine. The results obtained in the FDTE could not have been obtained by continued testing in a laboratory environment. The main point learned from the FDTE was that the present system (hardware and software) would not support the performance requirements prescribed by the AFATDS user. The PM ordered Reduced Instruction Set Computers (RISC) for use during the Initial Operational Test and Evaluation (IOTE) to enable AFATDS to meet Version 1 performance requirements. The software functionality for IOTE was completed in Jun 94. Current efforts are concentrated on continued error identification and correction. The final software is scheduled to be delivered in Dec 94 to begin Software System Acceptance Testing.

A General Officer Conference call was held on 11 Mar 94 to discuss the IOTE schedule. Based on the PM's analysis of the software development contractor's ability to correct the deficiencies demonstrated at FDTE, the correction of known software faults and the additional functionality required for IOTE, it was recommended that the AFATDS IOTE be delayed from July 94 to July 95.

AFATDS successfully participated in a number of other tests conducted over the summer of 1994, using revised software and RISC hardware. AFATDS participated in the EPLRS Pilot Test conducted in July 94 and the Enhanced Position Location Reporting System (EPLRS) IOTE successfully completed in Aug 94. In Aug, AFATDS also participated in the ATCCS III Integrated Interoperability Demonstration (IID) at Fort Hood, Texas. During the IID, AFATDS successfully demonstrated the horizontal exchange of messages with the other four battlefield functional systems; Maneuver Control System (Version 12 prototype), Forward Area Air Defense Command and Control System Force Operations, All Source Analysis System Collateral Workstation (ASAS-CWS), and the Combat Service Support Control System. The highlight of the exercise was the rapid exchange of the Target Intelligence Data Message between AFATDS and the ASAS-CWS demonstrating AFATDS' ability to support deep battle operations. Concurrent with the IID, the 1st Cavalry Division DIVARTY conducted an AFATDS Early User Experiment (EUE). AFATDS demonstrated that it could meet mission processing requirements and actually ran 175 missions in an hour which is beyond the Version 1 requirement of 120 missions per hour. Also, the Fire Support Automated Test System (FSATS) demonstrated its ability to

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7b. Program Highlights (Cont'd):

successfully capture and reduce VMF message formats during the EUE.

In order to ensure that the AFATDS software development contractor concentrated all of its efforts on the completion of Version 1, a Stop Work Order for AFATDS Version 2 was issued by the Procuring Contracting Officer on 11 Mar 94. The Stop Work Order was extended in Oct 94 for an additional 180 days pending delivery of the Version 1 software.

The PM formed a Senior Review Committee (SRC) of known experts in the field of software development to assess the contractor's schedule and technical issues. The Committee consisted of experts from MITRE, Intermetrics, Rational and SRI. The Committee met with Magnavox Electronic Systems Corporation (MESC) during Spring/Summer 1994. The Committee found that the Version 1 software architecture was sound and would meet Version 1 requirements and could be used for Version 2. The Committee found that the quality of code written was good and they were satisfied with the speed and quality of the porting to the RISC computers.

Due to the delay in the operational testing of AFATDS Version 1, previous delays in Version 2 and the projected delays on Version 2 caused by the Stop Work Order, the PM submitted a notification to the Assistant Secretary of the Army for Research, Development and Acquisition of a schedule breach of the AFATDS Program Baseline. In addition, as a result of the change to a HP 735 RISC hardware baseline, loss of quantity discounts and increased quantities of hardware, a procurement cost breach was also reported. RDTE costs have breached the baseline threshold due to growth in the Version 1 contract cost and additional management costs resulting from the extended development schedule. A potential Nunn-McCurdy breach in the Program Acquisition Unit Cost was also briefed. An Enhanced Program Stability Panel was convened in May to review the AFATDS program in response to the cost and schedule breaches. The Panel believed that the corrective actions being taken by the PM and PEO were the correct ones. All action items from the Panel were completed by July 94.

The FSAC and IFSAS programs continued procurement and fielding of hardware.

AFATDS is expected to satisfy the mission requirements.

c. Changes Since As Of Date --

In Oct 94, the SRC met with MESC and reviewed the progress of the Version 1 software. The Committee was satisfied with the progress to date, and was optimistic that MESC would be able to deliver the

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7c. Program Highlights (Cont'd):

software in Dec 94 as scheduled.

The Version 2 Stop Work was extended until Dec 94 to allow for the continued concentration on Version 1 by MESC.

8. Threshold Breaches:

There are schedule breaches of 6 months or more to the approved Acquisition Program Baseline (APB), 4 Oct 92. The cost impact of the breaches and/or the program restructure will be included in the next SAR. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Concept Evaluation (CE) Contract Award	MAY 84	MAY 84	MAY 84
Common HW/SW (CHS) Contract Award	AUG 88	AUG 88	AUG 88
CHS Initial Prototype (V1) Delivery	NOV 88	NOV 88	NOV 88
Software Formal Qualification Test Complete	JAN 89	JAN 89	JAN 89
User Concept Evaluation:			
Begin	MAR 89	MAR 89	MAR 89
Complete	APR 89	APR 89	APR 89
CHS Initial Ruggerized (V2) Delivery	JUN 89	JUN 89	JUN 89
ASARC II	JUL 89	JUL 89	JUL 89
DAB	SEP 89	SEP 89	SEP 89
Congressional Report	SEP 89	SEP 89	SEP 89
Full Scale Development Contract	APR 90	APR 90	APR 90
Preliminary Design Review (PDR) V1 (Start)	JUN 91	JUN 91	JUN 91
Critical Design Review (CDR) V1 (Start)	MAY 92	MAY 92	JUN 92
Version 2 SW Development Begin	MAY 92	MAY 92	OCT 92
CHS Hardware Order (AFATDS Training Base)	NOV 92	OCT 93	JAN 94
V3 Acquisition Alternative Selection	DEC 92	DEC 92	JUN 93
System Software Test V1	MAY 93	MAY 93	NOV 93
CHS Hardware Delivery (AFATDS Training Base)	JUN 93	APR 94	JUN 94
Force Development Test and Experimentation (FDT&E) -- Complete	JUL 93	OCT 93	FEB 94
First Unit Equipped (FUE) V1	SEP 93	MAR 94	AUG 95 (Ch-1)
Preliminary Design Review V2 (Start)	NOV 93	JUN 94	N/A (Ch-2)
IOTE:			

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9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development <u>Estimate</u>	Approved <u>Program</u>	Current <u>Estimate</u>
Begin	JAN 94	FEB 94	JUL 95 (Ch-1)
Complete	FEB 94	MAR 94	AUG 95 (Ch-1)
ASARC -- Milestone III	APR 94	JUN 94	NOV 95 (Ch-1)
C3I Committee Review	N/A	AUG 94	NOV 95 (Ch-1)
CDR V2 (Start)	JUN 94	JAN 95	N/A (Ch-2)
Version 3 SW Development -- Begin	NOV 94	NOV 94	JUL 97 (Ch-2)
System Software Test V2	JAN 95	SEP 95	N/A (Ch-2)
Initial Operational Capability (V1)	JAN 95	SEP 95	JUL 96 (Ch-1)
FDTE V2	MAR 95	JAN 96	N/A (Ch-2)
FUE V2	MAY 95	JUN 96	N/A (Ch-2)
FOTE V2:			
Begin	MAY 95	APR 96	N/A (Ch-2)
Complete	JUL 95	JUN 96	N/A (Ch-2)
Fielding Total Force -- Start (V2)	SEP 95	N/A	N/A
Fielding Total Force - Start (V1)	N/A	SEP 95	JUL 96 (Ch-1)
System Design Review V2.0	N/A	N/A	JAN 95 (Ch-2)
System Design Review V2.1	N/A	N/A	JAN 96 (Ch-2)
System Software Test V2.0	N/A	N/A	FEB 97 (Ch-2)
System Software Test V2.1	N/A	N/A	FEB 98 (Ch-2)
Operational Test V2.0	N/A	N/A	AUG 97 (Ch-2)
Operational Test V2.1	N/A	N/A	AUG 98 (Ch-2)

b. Previous Change Explanations --

The CHS Hardware Order was moved from Nov 92 to Oct 93, and the corresponding CHS Hardware Delivery was moved from Jun 93 to Apr 94. This was due to the elimination of FY93 Other Procurement, Army AFATDS funds in the FY91 appropriation language. The milestones were further delayed to Jan/Jun 94, respectively, due to the delay in release of appropriated funds.

FDTE Complete was rescheduled from Jul 93 to Feb 94. IOTE Begin moved from Jan 94 to Jul 94. The corresponding milestones for IOTE Complete was moved from Feb 94 to Sep 94. The ASARC Milestone III moved from Apr 94 to Dec 94. Based on the contract negotiations for AFATDS V1, the FDTE test window was Jun/Jul 93. Subsequent to contract award the Vice Chief of Staff established prescribed test windows for ATCCS testing with III Corps assets at Fort Hood to preclude perturbations to the warfighting mission of III Corps units in FY93. The test windows were May/June and Sept/Oct. The AFATDS V1 schedule precluded participation in the May/June 93 test window. As such, the AFATDS V1 FDT&E was moved to the Sept/Oct 93 test window. However, at the AFATDS Operational Test Readiness Review, held Aug 93

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9b. Schedule (Cont'd):

at Ft Sill, it was agreed that FDTE start date would be moved from Oct 93 to Jan 94 in order to allow adequate time for development of quality training for FDTE test personnel. Current estimates for FUE IOTE, ASARC, IOC, C3I Committee Review, IOC V1 and Fielding Total Force were adjusted accordingly.

The First Unit Equipped V1 moved from Sep 93 to Mar 94. First Unit Equipped V2 moved from May 95 to Jul 95. FUE for Version 1 was originally scheduled for Sep 93 to coincide with the completion of FDTE (DCSOPS guidance) and FUE Version 2 was originally scheduled for the beginning of FOTE V2. FUE is now scheduled to coincide with the last month of the system testing, i.e., IOTE V1 (3/94) and FOTE V2 (7/95). This rescheduling of FUE is consistent across all BFA's and is IAW PEO CCS guidance.

The Initial Operational Capability V1 moved from Jan 95 to Sep 95. The old definition of IOC was based on refurbishment of test units which is still planned for Jan 95. The new definition of IOC is based on the first production unit fielded after ASARC (M/S III) which is scheduled for Jul 96.

The Version 2 software development occurred in Oct 92 vice Mar 92 due to extended negotiations complicated by program funding reductions. All milestones for Version 2 were adjusted accordingly.

The Version 1 development effort encountered delays due to unexpected complexity in the software design. Accordingly, Version 1 milestones were adjusted as follows: Critical Design Review (CDR) V1 occurred in Jun 92 vice May 92 and System Software Test (SST) V1 was moved from May 93 to Aug 93. The System Software Test (SST) V1 was moved from Aug 93 to Nov 93 due to delays on the software delivery caused by complexity in the program design.

The V3 Acquisition Alternative Selection was moved from Dec 92 to Apr 93 in order to allow for Government review of the quality of Version 1 software as delivered by the builder prior to determination of the V3 acquisition strategy. The V3 Acquisition Alternative Selection was actually accomplished in Jun 93 due to the delay in Version 1 delivery.

Version 3 Software Development - Begin has been rescheduled from Nov 94 to May 95 due to unanticipated delays in Version 1 completion and the resulting necessity to stretch out subsequent versions of the software development.

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9c. Schedule (Cont'd)

c. Current Change Explanations --

(Ch-1) IOTE - Begin was rescheduled from Jul 94 to Jul 95, based on the time required to correct deficiencies found in the FDIEX. As a result, the following additional adjustments were made: IOTE - Complete was moved from Mar 94 to Aug 95, First Unit Equipped moved from Mar 94 to Aug 95, ASARC moved from Jun 94 to Nov 95, C3I Committee Review moved from Aug 94 to Nov 95, IOC V1 moved from Sep 95 to Jul 96 and Fielding Total Force - V1 moved from Sep 95 to Jul 96.

(Ch-2) The development strategy for Version 2 was changed to expedite software upgrades and provide improvements to the field on a more timely basis. The change in strategy resulted in Version 2 being developed in two separate packages: Version 2.0 and Version 2.1. Accordingly, the following Version 2 milestones will no longer be tracked in the APB: Preliminary Design Review (Jun 94), Critical Design Review (Jan 95), System Software Test (Sep 95), Force Development Test and Experimentation (Jan 96) and First Unit Equipped (Jun 96). Additionally, the following new milestones have been added to the baseline to detail the Version 2.0 and Version 2.1 packaging: Version 2.0 System Design Review (Jan 95), Version 2.0 System Software Test (Feb 97), Version 2.0 Operational Test (Aug 97), Version 2.1 System Design Review (Jan 96), Version 2.1 System Software Test (Feb 98), Version 2.1 Operational Test (Apr 98). Finally, the Version 3 Software Development Begin date has been moved to Jul 97 to allow sufficient time for development and test of prior versions of software.

d. References --

Development Estimate:

AAE Approved Acquisition Program Baseline dated 15 August 1990.

Approved Program:

AAE Approved Acquisition Program Baseline dated 04 October 1992.

10. Performance Characteristics:

a. Performance --		Approved Program		Demonstrated	Current
	<u>DE</u>	<u>Objective/Threshold</u>		<u>Perf</u>	<u>Estimate</u>
TECHNICAL					
MTBF-Hardware (hrs)				N/A	N/A
Fire Support Control	636	N/A	/ N/A	N/A	N/A
Terminal (FSCT)					

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10a. Performance Characteristics (Cont'd):

	DE	Approved Program <u>Objective/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Fire Support Terminal (FST)	1000	N/A	/ N/A	N/A	N/A
MTTR-System - Unit Level (min)					
FSCT	20	N/A	/ N/A	N/A	N/A
FST	20	N/A	/ N/A	N/A	N/A
MIPS (Million Instruc- tions per sec)					
FSCT	12	N/A	/ N/A	N/A	N/A
FST	12	N/A	/ N/A	N/A	N/A
Internal Memory (Mega- bytes)					
FSCT	16	N/A	/ N/A	N/A	N/A
FST	16	N/A	/ N/A	N/A	N/A
System Ao-(Wartime) (Operating 24 hrs/day for 108 hours)					
Version 1	.90	.90	/ .80	TBD	.90
Version 2	.90	.90	/ .85	TBD	.90
Version 3	.90	.90	/ .88	TBD	.90
Fire Mission Proces- sing Peak Load (Fire Missions/hr)					
Version 1	247	247	/ 120	TBD	247
Version 2	513	513	/ 420	TBD	513
Version 3	780	780	/ 720	TBD	780
Fire Mission Proces- sing Speed (secs)					
Version 1	14.5	N/A	/ N/A	N/A	N/A
Version 2	7.0	N/A	/ N/A	N/A	N/A
Version 3	4.6	N/A	/ N/A	N/A	N/A
Power Requirements (KW)					
FSCT	1.4	N/A	/ N/A	N/A	N/A
FST	0.8	N/A	/ N/A	N/A	N/A
Sustainment of Oper- ation During Power Loss (min)	5	5	/ 3	TBD	5
Emergency Purge (min)	2	2	/ 4	TBD	2
Set-up/Tear-down (min)	10	10	/ 15	TBD	10

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10a. Performance Characteristics (Cont'd):

	<u>DE</u>	<u>Approved Program Objective/Threshold</u>		<u>Demon- strated Ref</u>	<u>Current Estimate</u>
Weight in Pounds (Less Radios)					
FSCT	400	N/A	/ N/A	N/A	N/A
FST	243	N/A	/ N/A	N/A	N/A
Operating Temperature (deg F)	0-120	0-120	/ 0-110	TBD	0-120
Process Combat Information Message (per hour)					
Version 1	N/A	323	/ 157	TBD	323
Version 2	N/A	650	/ 526	TBD	650
Version 3	N/A	970	/ 895	TBD	970
Develop Orders to Fire (per hour)					
Version 1	N/A	359	/ 168	TBD	359
Version 2	N/A	723	/ 580	TBD	723
Version 3	N/A	1078	/ 995	TBD	1078
Establish and Update Battlefield Geometry (min)					
Version 1	N/A	1	/ 2	TBD	1
Version 2	N/A	1	/ 2	TBD	1
Version 3	N/A	1	/ 2	TBD	1
Change Attack Guidance (min)					
Version 1	N/A	2	/ 3	TBD	2
Version 2	N/A	2	/ 3	TBD	2
Version 3	N/A	2	/ 3	TBD	2
Coordinate Movement Request with Maneuver (min)					
Version 1	N/A	4.6	/ 5	TBD	4.6
Version 2	N/A	3.8	/ 5	TBD	3.8
Version 3	N/A	3	/ 4	TBD	3
Prepare Quick Fire Plan (min)					
Version 1	N/A	10	/ 15	TBD	10
Version 2	N/A	10	/ 15	TBD	10
Version 3	N/A	10	/ 15	TBD	10
Process Field Artillery Sensor Tasking Order (min)					

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10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demon- strated Perf	Current Estimate
Version 1	N/A	4	/ 6	TBD	4
Version 2	N/A	2	/ 3	TBD	2
Version 3	N/A	1.3	/ 1.5	TBD	1.3
Process Fire Support Coordination Measure (FSCM) (min)					
Version 1	N/A	2	/ 3	TBD	2
Version 2	N/A	2	/ 3	TBD	2
Version 3	N/A	2	/ 3	TBD	2

Notes:

All Hardware related technical parameters are dependent upon ATCCS common hardware components. The printer MTBF is not included in MTBF-Hardware. The printer is not mission essential. Set-up/Tear-down is for a Standard Integrated Command Post System (SICPS) without tentage erected.

b. Previous Change Explanations --

Hardware related parameters such as MTBF, MTTR, MIPS, Power and Weight were deleted in the Oct 92 APB as they reflect performance characteristics of the ATCCS Common Hardware Software.

System specific software parameters were added in the Oct 92 APB to reflect the technical characteristics of the AFATDS functional software as identified in program requirements documentation.

c. Current Change Explanations -- None

d. References --

Development Estimate:

AAE Approved Acquisition Program Baseline dated 15 August 1990.

Approved Program:

AAE Approved Acquisition Program Baseline dated 04 October 1992.

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11e. Total Program Cost and Quantity (Cont'd):

Approved Program:

AAE Approved Acquisition Program Baseline dated 04 October 1992.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	<u>Current</u> <u>Estimate</u>	<u>Current Year</u> <u>UCR Baseline</u>	<u>Budget Year</u> <u>UCR Baseline</u>
a. Program Acquisition	(Sep 94 SAR)	(DEC 92 SAR)	(DEC 93 SAR)
(1) Cost (TY\$)	949.7	876.8	349.7
(2) Quantity	4768	4445	4768
(3) Unit Cost	0.199	0.197	0.199
b. Current Procurement --	(FY 1994)	(FY 1994 APPN)	(FY 1995)
(1) Cost (TY\$)	53.1	53.1	51.7
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Net Total	53.1	53.1	51.7
(2) Quantity	626	626	477
(3) Unit Cost	0.085	0.085	0.108

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13. Cost Variance Analysis:

a. Summary (Current (Then-Year) Dollars in Millions)

	RD&E	PROC	MILCON	TOTAL
Development Estimate	422.3	629.8	0.0	1052.1
Previous Changes:				
Economic	-5.6	-2.8	-	-8.4
Quantity	-	+183.4	-	+183.4
Schedule	+0.3	+6.0	-	+6.3
Engineering	-	-	-	-
Estimating	+2.4	-212.4	-	-210.0
Other	-	-	-	-
Support	-	-73.7	-	-73.7
Subtotal	-2.9	-99.5	-	-102.4
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-2.9	-99.5	-	-102.4
Current Estimate	419.4	530.3	-	949.7

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13a. Cost Variance Analysis (Cont'd):

a. Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDTE	PROC	MILCON	TOTAL
Development Estimate	390.7	469.7	0.0	860.4
Previous Changes:				
Quantity	-	+140.4	-	+140.4
Schedule	-3.7	-	-	-3.7
Engineering	-	-	-	-
Estimating	+4.7	-156.0	-	-151.3
Other	-	-	-	-
Support	-	-57.0	-	-57.0
Subtotal	+1.0	-72.6	-	-71.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	+1.0	-72.6	-	-71.6
Current Estimate	391.7	397.1	-	788.8

b. Previous Change Explanations --

RDTE

Economic: Revised escalation indices; Economic Adjustment for Negative Program Change.

Schedule: Revised development schedule due to funding profile changes.

Estimating: Adjustment for Current and Prior Inflation; Additional funding for program continuation in FY98 and FY99; Decreased levels of engineering and management support.

Procurement

Economic: Revised escalation indices; Economic Adjustment for Negative Program Change.

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13b. Cost Variance Analysis (Cont'd):

Quantity: Quantity increase from 3184 to 4308 due to change in deployment philosophy.

Schedule: Revised production schedule due to funding profile changes.

Estimating: Adjustment for Current and Prior Inflation; Decrease in contractual costs due to revised pricing assumptions and techniques, as well as changes in CHS nonrecurring cost guidance.

Support: Changes due to reprogrammed funding for Total Package Fielding costs; Decrease in support cost per revised CHS pricing guidance; Adjustment for Current and Prior Inflation.

c. Current Change Explanations -- None.

14. Program Acquisition Unit Cost (PAUC) History (Then-Year Dollars in Millions):

Current SAR Baseline to Current Estimate --

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.317	-0.002	-0.058	0.001	--	-0.044	--	-0.015	-0.118	0.199

15. Contract Information (Then-Year Dollars in Millions):

a. RDT&E --

AFATDS V1:

Magnavox Government, Fort Wayne, IN
DAAB07-90-C-E708, CPAF/FP
Award: April 27, 1990
Definitized: April 27, 1990

Initial Contract Price

Target	Ceiling	Qty
\$60.5	\$0.0	1

Current Contract Price

Target	Ceiling	Qty
\$79.7	\$0.0	1

Estimated Price At Completion

Contractor	Program Manager
\$114.7	\$120.0

Previous Cumulative Variances

Cumulative Variances To Date (07/31/94)

Net Change

Cost Variance	Schedule Variance
\$-16.0	\$-0.1
\$-19.2	\$0.0
\$-3.2	\$0.1

Explanation of Change: None.

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15. Contract Information (Cont'd):

The Version 1 effort is more than 90% complete at this time. Although it was reported in the last SAR that it would be the last report submitted for this contract, because of the continuing cost growth and schedule delays, it is included in this report.

The Current Contract Price has increased with the addition of scope of work through contract modifications. These additional efforts include a port to RISC computer, Class of Interface Changes and Embedded Training/Individual Training. The Contract Budget Base has not exceeded the Contract Cost Baseline.

The contract shows a schedule and cost variance due to resource shortages and complexity of design. Previous variances reflected the additional development effort required to overcome the unexpected complexity in the software design. The increase in variances over FY94 reflects unplanned effort to resolve deficiencies found during testing.

The contract was replanned in Apr. The contractor set the Budgeted Cost of Work Scheduled equal to the Budgeted Cost of Work Performed, thus eliminating schedule variance. The contractor then laid in a new plan with an estimate to complete for the work remaining. An additional contractor conducted Estimate to Complete was performed in July which was used as the basis for an Internal Operating Budget (IOB) by which the program will be managed to its completion.

The current Latest Revised Estimate (LRE) is based on the cost for the contractor to continue to provide support, fix software deficiencies and optimize software through the completion of IOTE in Aug 95.

<u>AFATDS V2:</u>			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Magnavox Ele. Sys. Co, Ft Wayne, IN	\$47.4	\$0.0	1		
DAAB07-90-C-E708, Mix					
Award: October 28, 1992					
Definitized: N/A					

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$47.4	\$0.0	1	\$47.8	\$47.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.6	\$-0.6
Cumulative Variances To Date (03/27/94)	\$-0.6	\$-0.6
Net Change	\$0.0	\$0.0

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15. Contract Information (Cont'd):

Explanation of Change:

A Stop Work Order for Version 2 was issued effective 1 Apr 94.

16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Program Status --

(1) Percent Program Completed: 58.3% (14 yrs/24 yrs)

(2) Percent Program Cost Appropriated: 44.9% (\$426.2 / \$949.7)

b. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY81-93)</u>	<u>Budget Year (FY94)</u>	<u>Budget Year (FY95)</u>	<u>Balance To Complete (FY96-2004)</u>	<u>Total</u>
RDT&E	255.4	45.9	48.7	69.4	419.4
Procurement	71.8	53.1	51.7	353.7	530.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	327.2	99.0	100.4	423.1	949.7

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Encl Rate (%)
		Nonrec	Rec		Program	Obl- gated	Ex- pended	

Appropriation: RDT&E - All Sources

1981				1.9	1.4	1.4	1.4	10.6
1982				2.2	1.7	1.7	1.7	7.6
1983				4.1	3.3	3.3	3.3	4.0

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16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Escl Rate (%)
		Nonrec	Rec		Program	Obli- gated	Ex- pended	

Appropriation: RDT&E - All Sources (Cont'd)

1984				12.2	15.3	15.3	15.3	3.8
1985				27.3	23.6	23.6	23.6	3.4
1986				18.5	16.5	16.5	16.5	2.8
1987				7.9	7.2	7.2	7.2	2.7
1988				11.7	11.1	11.1	11.1	3.0
1989				17.3	17.1	17.1	17.1	4.2
1990				28.0	28.7	28.7	28.7	4.1
1991				37.6	40.1	40.1	38.4	4.3
1992				44.8	49.1	49.1	49.0	3.0
1993				35.8	40.3	40.3	38.9	2.7
1994				39.8	45.9	38.9	28.8	2.5
1995				41.0	48.7			2.8
1996				26.0	31.8			2.9
1997				24.9	31.4			3.0
1998				2.4	3.1			3.0
1999				2.3	3.1			3.0
Subtot	137			391.7	419.4	294.3	281.0	

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16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Encl Rate (%)
		Nonrec	Rec		Program	Obliga- gated	Ex- pended	

Appropriation: Procurement - All Sources

1988		8.8		8.8	8.8	8.8	8.8	3.0
1989								4.2
1990								4.1
1991								4.3
1992	831	7.0	24.6	33.2	37.6	37.5	16.2	3.0
1993	492	4.2	14.6	21.8	25.4	24.6	11.1	2.7
1994	626	9.5	25.4	44.7	53.1	41.7	14.1	2.5
1995	477	7.8	24.2	42.1	51.7			2.8
1996	292	4.1	21.9	33.3	42.2			2.9
1997	424	4.4	22.9	35.3	46.0			3.0
1998				1.6	2.1			3.0
1999				2.0	2.7			3.0
2000	516	5.9	30.2	41.3	58.8			3.0
2001	229	6.0	29.1	41.9	61.5			3.0
2002	399	5.9	27.8	40.9	61.8			3.0
2003	345	5.9	27.7	40.5	63.1			3.0
2004		5.9		9.7	15.5			3.0
Subtot	4631	75.4	248.4	397.1	530.3	112.6	50.2	

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16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Escl Rate (\$)
		Nonrec	Rec		Program	Oblig- ated	Ex- pended	

Appropriation: MILCON - All Sources - None.

Appropriation: O&M - All Sources - None.

Total	4768	75.4	248.4	788.8	949.7	406.9	331.2	
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Appropriation: 2040 Research, Development, Test + Eval, Army

1981				1.9	1.4	1.4	1.4	10.6
1982				2.2	1.7	1.7	1.7	7.6
1983				4.1	3.3	3.3	3.3	4.0
1984				18.2	15.3	15.3	15.3	3.8
1985				27.3	23.6	23.6	23.6	3.4
1986				18.5	16.5	16.5	16.5	2.8
1987				7.9	7.2	7.2	7.2	2.7
1988				11.7	11.1	11.1	11.1	3.0
1989				17.3	17.1	17.1	17.1	4.2
1990				28.0	28.7	28.7	28.7	4.1
1991				37.6	40.1	40.1	38.4	4.3
1992				44.8	49.1	49.1	49.0	3.0
1993				35.8	40.3	40.3	38.9	2.7
1994				39.8	45.9	38.9	28.8	2.5

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16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Excl Rate (%)
		Nonrec	Rec		Program	Obligat- ed	Ex- pended	

Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)

1995				41.0	48.7			2.8
1996				26.0	31.8			2.9
1997				24.9	31.4			3.0
1998				2.4	3.1			3.0
1999				2.3	3.1			3.0
Subtot	137			391.7	419.4	294.3	281.0	

Appropriation: 2035 Other Procurement, Army

1988		8.8		8.8	8.8	8.8	8.8	3.0
1989								4.2
1990								4.1
1991								4.3
1992	275	3.9	10.3	15.0	17.0	16.9	16.2	3.0
1993	131	2.5	5.8	10.9	12.7	11.9	11.1	2.7
1994	626	8.2	25.4	40.5	48.1	36.7	14.1	2.5
1995	477	7.8	24.2	42.1	51.7			2.8
1996	292	4.1	21.9	33.3	42.2			2.9
1997	424	4.4	22.9	35.3	46.0			3.0

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16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year\$	Total Then-Year \$			Escl Rate (%)
		Nonrec	Rec		Program	Obli- gated	Ex- pended	

Appropriation: 2035 Other Procurement, Army (Cont'd)

1998				1.6	2.1			3.0
1999				2.0	2.7			3.0
2000	516	5.0	30.2	41.3	58.8			3.0
2001	229	6.0	29.1	41.9	61.5			3.0
2002	399	5.9	27.8	40.9	61.8			3.0
2003	345	5.9	27.7	40.5	63.1			3.0
2004		5.9		9.7	15.5			3.0
Subtot	3714	69.3	225.3	363.8	492.0	74.3	50.2	
Army	3851	69.3	225.3	755.5	911.4	368.6	331.2	

Appropriation: 0350 National Guard & Reserve Equipm, Defense

1992	556	3.1	14.3	18.2	20.6	20.6		3.0
1993	361	1.7	8.8	10.9	12.7	12.7		2.7
1994		1.3		4.2	5.0	5.0		2.5
Subtot	917	6.1	23.1	33.3	38.3	38.3		
DoD	917	6.1	23.1	33.3	38.3	38.3		
Grand Total	4768	75.4	248.4	788.8	949.7	406.9	331.2	

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17. Production Rate Data:

a. Production Baseline Rate

AFATDS system hardware will be procured off the Common Hardware Software (CHS) MILTOPE and SAIC contracts managed by PM Common Hardware Software. The contracts are for non-developmental items. The steady state full production rate for the MILTOPE contract is identified as 200 units per month. The steady state full production rate for the SAIC contract is 300 units per month. Annual production rates for both contracts are determined based on the combined requirements of all the Army Tactical Command and Control Systems (ATCCS) programs.

b. Cost and Quantity Variances (Then Year Dollars in Millions)

	Minimum Sustaining	Current Estimate	Maximum Economic	Min Sustain less CE	Maximum less CE
FY 1994					
Procurement Cost		53.1		N/A	N/A
Procurement Qty		626		N/A	N/A
Proc. Unit Cost	N/A	0.085	N/A	N/A	N/A
FY 1995					
Procurement Cost		51.7		N/A	N/A
Procurement Qty		477		N/A	N/A
Proc. Unit Cost	N/A	0.108	N/A	N/A	N/A
Balance of Proc. (FY 1996 to Complete)		353.7		N/A	N/A

As the full production rates for the CHS contracts are based on the combined requirements of the ATCCS programs, cost and quantity variances cannot be determined on an individual program basis.

c. Deliveries (Plan/Actual) --

	<u>To Date</u>
RDT&E	137/137
Procurement	1323/1217

d. Approved Design-to-Cost Objective -- N/A.

The AFATDS will utilize Common Hardware equipment. There is no Design-to-Cost Objective for the program.

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18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The O&S costs are to operate and maintain the AFATDS system, based on a peacetime operating tempo of 1800 hr/yr. The costs are based on an operating life of 20 years, with a replacement of the CHS hardware after 10 years. The CHS will be contractor maintained above the unit level at Regional Support Centers. Costs are from the AFATDS Baseline Cost Estimate, March 1990, and FSAC Baseline Cost Estimate, Jan 1992. Costs are shown per division.

The AFATDS will replace the TACFIRE/LTACFIRE systems and associated Fire Support hardware. FSAC will replace the current BCS system. The costs shown were provided by the Field Artillery School (USAFAS), Ft Sill, and reflect TACFIRE support costs only. Military personnel costs are assumed to be the same as for the AFATDS and TACFIRE as crew requirements will be unchanged.

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per DIVISION	Avg Annual Cost Per TACFIRE SYSTEM
Military Personnel	15.6	15.6
Other	4.8	15.3
Total	20.4	30.9

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1993 & Prior	FY1994	FY1995	Balance To Complete	Total
Eng/Tech Services	0.3	---	---	---	0.3
Total	0.3	---	---	---	0.3